The Northwest Technology Transfer Center
BULLETIN
Number 39 Summer 1993
A Newsletter of the Local Technical Assistance Program (LTAP)

Handling Questions and Confrontation

Question-and-answer sessions are a way of life for municipal leaders. Regardless of how polished and compelling your presentation, the question-and-answer period can be unpredictable and even threatening.

Success in dealing with legitimate, tough, probing questions requires mastery of a few basic skills:

- **Anticipate the difficult questions you might be asked.**
- **Prepare appropriate responses.** Do not memorize answers word for word; know the basic concepts.
- **Listen carefully.** Pause reflectively. Make sure the question does not contain misstatements or assumptions you feel compelled to defend. If it helps, restate or rephrase the question in your own words. And, if you do not understand the question, ask that it be rephrased or clarified.
- **Respond with short, crisp, specific answers.** This keeps the session moving. Remember, a question is not a signal for another presentation.
- **Be polite but firm and flexible.** Avoid debating a questioner. You may have to defend yourself or your position at times, but maintain control of your intensity and emotions.

Uncivil Discourse

Dealing withopen hostility is far different from handling tough questions. Because of the nature of municipal government, your views or policies may sometimes trigger blatant antagonism and even personal attacks.

Although you cannot prepare adequately for all confrontations, you can deal with them effectively and professionally by keeping these points in mind:

- **Listen.** Do not interrupt. Hear the person out.
- **Maintain your composure.** Depersonalize the attack by keeping your ego in check. Keep in mind that your organization — not you — may be the target. The anger may be a natural part of the questioner's personality rather than an indication of how he or she feels about you. Remember, too, that the audience does not necessarily agree with the attacker.
- **Take the high road.** Ignore the hostility and stay professional. Cut through the emotionalism of the moment and answer the factual point made by the questioner.
- **Do not be defensive.** Avoid counter-attacks. No purpose is served by getting into a sparring match with a mudslinger. ■

(Source: From Connecticut Town and City, Connecticut Conference of Municipalities, May-June 1990)

Educational Opportunities

The purpose of this column is to inform you of the numerous educational opportunities that exist for our Washington State and adjacent states' transportation people. We also place this information on our electronic bulletin board. To obtain a brochure of details on the workshops listed, please contact the Northwest T² Center at (206) 753-0405.

Northwest Technology Transfer Center------(206) 705-7389

The T² Center offers or supports numerous workshops of interest to public works agencies in Washington. Announcements are advertised in the newsletter, the *Bulletin*, and flyers are sent out to public works agencies requesting their interests prior to the workshops.

- ❑ **Bicycle Planning and Facilities Workshop.** August 12-13, 1993, Kent, WA.

Relocation Workshop Being Considered. WSDOT is considering holding a one-day workshop for persons and personal property displaced by public works projects. The workshop would be open to all local public agencies who desire more information about the uniform relocation act, as amended in 1987 and for those who have specific relocation cases to discuss. Please call, Daryl Olson or Alan House at (206) 705-7318. If enough interest is generated, WSDOT plans to hold the workshops late in the summer.

County Road Administration Board (CRAB) ----------(206) 753-5989

If there is a special class you would like to see developed for counties, contact CRAB.

Battelle----------1-800-426-6762

Registrations for workshops are taken on first come, first serve basis. Call Battelle for additional information.

- ❑ **Leadership that Shapes the Future.** September 26-October 1, 1993; December 5-10, 1993, Seattle. Cost $3,000.
- ❑ **The Effective Manager.** July 26-28, 1993, Seattle. Cost $895.
- ❑ **Effective Program Management.** September 16-17, 1993, Seattle; December 9-10, 1993, Portland, OR. Cost $885.
- ❑ **The Engineer as Manager.** August 16-17, 1993, Portland, OR; November 4-5, 1993, Seattle. Cost $885.

Skillpath Inc. ----------1-800-873-7545

- ❑ **Creating Self-Directed Work Teams.** July 26, 1993, Portland Marriott, Portland, OR; July 27, 1993, Sheraton Hotel and Towers, Seattle. Cost $99.
- ❑ **Coaching and Teambuilding Skills for Managers and Supervisors.** August 16, Tacoma; August 17, Bellevue; August 18, Seattle; August 19, Everett; August 20, Bellingham; September 1, Yakima; September 27, Seattle. Fee $99.

Professional Engineering Practice Liaison Program (PEPL), University of Washington College of Engineering (206) 543-5539

(All classes are at the University of Washington unless otherwise noted.)

- ❑ **Avoidance and Resolution of Construction Delay Claims in Public Works Projects: The Owner's Perspective.** September 17, 1993. Tacoma Branch, University of Washington. Cost $165.
- ❑ **Partnering in Small to Medium-Sized Public Works Projects: Pros and Pitfalls.** October 12, 1993, Yakima. Cost $150.
- ❑ **Effective Writing for Technical Professionals.** September 9, 14, 16, 21, and 23, 1993. Cost $295.
- ❑ **Basics of Project Management for Design Professionals.** September 14, 16, and 21, 1993. Cost $165.
- ❑ **Construction Site Erosion and Sediment Control Inspector Training Program.** October 20, 21, 27, and 28, 1993. Cost $495.
- ❑ **Bioremediation Technology for Hazardous Wastes.** October 25-26, 1993. Cost $350.
- ❑ **NPDES Permit Issues Workshop.** December 8, 1993. Cost $165.

National Businesswomen's Leadership Association 1-800-258-7246

- ❑ **Leadership and Supervisory Skills for Women.** July 19, 1993, Holiday Inn, Yakima; July 21, 1993, Holiday Inn Airport, Portland, OR. Cost $69.

Oregon T² Center ----------(503) 378-3421

Spaces may be available on some of the Oregon's T² Center workshops. Contact them right away if interested in attending the following:

- ❑ **Urban Drainage Design, NHI 13027.** September 28-30, Eugene, OR. Fee $130.
- ❑ **Seismic Design of Highway Bridges, NHI 13048.** October 18-22, Portland, OR. Fee $155.
- ❑ **Highway Project Traffic Forecasting, NHI 15251.** August 10-12, Portland or Salem, OR. Fee $200.

Washington State University Conferences and Institutes ----------(206) 840-4575

- ❑ **How to Use Self-Managing Work Teams.** August 16-17, 1993, Red Lion Inn, SeaTac. Cost $845.
- ❑ **Empowering Teams, People, and the Organization Through Horizonal Management.** September 21-22, 1993, Red Lion, SeaTac. Cost $795.
- ❑ **How to Implement the Deming Approach for Quality Improvement in Services.** September 28-29, 1993, Red Lion Inn, SeaTac. Cost $795.
- ❑ **How to Apply Deming's Quality Improvement Principles to Public Sector Services and Administration Operations.** September 30-October 1, 1993, Red Lion Inn/Columbia River. Cost $795.

Educational Opportunities (Contd.)

Conferences and Meetings

- **Environmental Analysis in Transportation, TRB Committee AIF02.** July 20-23, 1993, hosted by WSDOT, Western Hotel, Seattle. Contact Joanie Pop at (206) 705-7924.
- **Pacific Rim Transtech Conference.** July 25-28, 1993, Seattle, WA. For more information, contact James R. Buss, WSDOT, (206) 705-7801.
- **T² Regional Meeting.** July 28-29, 1993, Seattle.
- **International Conference on Transportation Facilities Through Difficult Terrain.** August 10-13, 1993, Aspen, CO. Contact Catherine Catt (303) 248-7237.
- **Washington State Public Transportation Conference.** August 31-September 2, 1993, Spokane. Contact Rosalin Wilmes at (206) 705-7921.
- **1993 Annual Conference, Western Councils of Government.** August 12-14, Coeur d'Alene, ID. Contact Spokane Regional Council (509) 625-6370.
- **ARRA (Asphalt Recycling and Reclaiming Association) Semi-Annual Meeting.** August 14-15, Dallas, TX. Contact ARRA (410) 267-0023.
- **APWA 1993 International Public Works Congress and Exposition.** September 18-23, 1993, Phoenix, AZ.
- **International Public Transit Expo '93.** October 4-6, 1993, New Orleans Convention Center. For more information, contact Carol Stream (708) 260-9700.
- **APWA Fall Conference.** October 12-15, 1993, Cavanaugh's, Yakima.
- **WSAC Legislative Conference.** November 17-19, 1993, Red Lion at the Quay, Vancouver.
- **1994 International Road Federation Conference.** July 2-4, 1994, Calgary, Alberta, Canada. Anyone interested in presenting a paper is requested to submit an abstract. Please contact Marc Brazeau at (613) 736-1395.

Need to Know More?

Make Use of WSDOT's Library

A Free T² Resource

(206) 705-7750
SCAN 705-7750

Standing By at a Confined Space

Your Role Is Safety

Whenever workers enter a confined space, at least one person should remain outside as a buddy, ready to help in case of trouble. A well-equipped buddy can make a dangerous job safer and, in some cases, can save lives. If you are a buddy, you should know how to keep a confined space a safe place, how to recognize hazards, and what to do in an emergency.

Prepare for Safety

Wear the same type of personal protective equipment (PPE) worn by the confined-space workers, including the appropriate respirator. Make sure each worker wears a lifeline or harness, which you can use to pull him or her out of the space. A rope tied around a worker's waist is not enough — you cannot use it effectively in case of injury or lack of consciousness.

Know how to use communications equipment to keep in continuous contact with workers and to order evacuation or rescue procedures. Also know in advance the procedures for summoning emergency rescue services. Be sure a third person is nearby to help if necessary.

Stay on duty. Do not leave your post for any reason unless an equally qualified buddy replaces you. If you have to leave and no replacement is available, order workers to leave the space.

Recognize Hazards

Be aware of potential hazards within the confined space, such as lack of oxygen, toxics, fires, explosions, or physical dangers. Know how to identify materials that are — or once were — there. Be alert to any changes in conditions, or in a worker's behavior, that might indicate exposure to hazards. If you notice workers complaining of or demonstrating dizziness, confusion, drowsiness, or have difficulty breathing, or if they fail to answer a communication, start rescue procedures at once. Unauthorized people who come near or enter the space can also pose a hazard; keep them away. If they do enter the confined space, inform workers inside.

Rescue!

If rescue is necessary, never enter the space yourself. Chances are high that you could be injured or killed before completing a rescue. In fact, more than 60 percent of confined-space fatalities occur among would-be rescuers. Be familiar with your agency's rescue plan, use appropriate rescue equipment and contact designated rescuers or emergency personnel.

Be Effective

An effective buddy can mean the difference between life and death for workers in a confined space. When your role is safety, play it well!

(Source: ©1991 Parlay International 1200.057)

When you are standing by while coworkers are in a confined space, wear proper personal protection equipment, stay alert, and stay in touch with the people inside the confined space.

Pedestrian Safety Programs Being Promoted for Nationwide Application

FHWA and NHTSA are increasing the visibility of pedestrian safety issues and solutions by encouraging states and communities to adopt community-based pedestrian safety programs. The goal is to increase the nationwide application of pedestrian safety programs at both the state and local levels. During May, a distinguished group of professionals came Washington, D.C. and shared their expertise and unique prospectives. The information from this group will assist FHWA and NHTSA in developing a Pedestrian Safety Strategic Plan and evaluation criteria.

Those who have agreed to serve on the Technical Working Group (TWG) will represent FHWA, NHTSA, state highway agencies, law enforcement agencies, local transportation agencies, universities, the American Automobile Association, the National Safety Council, and the Bicycle Federation of America.

The first meeting of TWG was held May 4 and 5 in Washington, D.C. The group will likely meet two more times over the next 18 months. For further information, call Mila Plosky, FHWA's Office of Highway Safety, (202) 366-6902, or Ron Engle, NHTSA, (202) 366-2717, David Tollett, (202) 366-6614.

(Source: Adapted from FHWA's "Research and Technology Transporter" May 1993)

Bridge Foundation Design Methods To Be Reviewed

Bridge foundation design procedures for significant one-time events, such as heavy ship impacts, seismic events, and flooding with heavy ice or debris, are not well defined. Because the methods of providing foundation capacity for loads from such special events are poorly defined, catastrophic failures are possible. For example, the old Sunshine Skyway bridge in Tampa Bay collapsed after a heavy ship collided with it, overloading the substructure.

In the past, designers have been aware of the need to design for these special events, but comprehensive codes and rational design models were not available or were inadequate. Additionally, there has been a lack of a multi-disciplinary approach necessary to coordinate the structural, geotechnical, and hydraulic considerations critical to proper designing. As a result, designs vary broadly from the very conservative (expensive) to the unconservative (inadequate safety factor against failure).

Several states have recognized these problems and have initiated R&D programs to develop more realistic and cost-effective design models. At the same time, engineers in the private sector are developing methods to account for loads generated by special design events and to design foundations accordingly. The Office of Technology Applications (OTA) is assisting FHWA's Bridge Division in evaluating currently used methods to determine the direction of future developments of improved design methods.

Two bridge design workshops are scheduled for June and August in Arlington, Virginia. During the workshops, FHWA and a Technical Working Group (TWG) established for the project will review a variety of methods and select one or more as interim techniques for use until new methods are developed. The TWG will also develop the agenda for a national conference to publicize the selected interim methods and proposed R&D work. Chris Dumas, (202) 366-8080.

(Source: FHWA's "Research and Technology Transporter" May 1993)

Understanding Our Road Signs

An ongoing three-year study by the Texas Transportation Institute at Texas A&M University is uncovering some interesting results regarding people's understanding of various traffic devices. Previous studies were done in 1979 and 1980, by the American Automobile Association and in 1978 and 1981, by the Texas Transportation Institute.

A survey was conducted at driver's license offices in 12 Texas cities using a 15-minute video that featured 46 different traffic control devices. Each question of the survey had four multi-choice answers, including one desirable answer, two within the "realm of possibilities," and one "not sure." The survey was given to 1,754 Texas drivers, and was a statistically valid sample.

Five devices that received good driver responses included: (1) "reduce speed ahead" sign, (2) "rough road" sign, (3) solid yellow line (no-passing centerline), (4) "watch for ice on bridge" sign, and (5) the "stop ahead" sign.

On the other hand five devices received poor correct responses by a majority of the people surveyed. These are shown below along with the questionnaire.

Three options to improve the comprehension of roadway messages were suggested by the researchers: (1) the devices can be redesigned, (2) a better explanation given in each driver's handbook, and/or (3) more effort placed on traffic control devices in driver education classes.

Editor's Note: I thought this article was particularly interesting in that we in the transportation business must always keep the user in mind when we are designing and placing traffic control devices. The *Manual of Uniform Traffic Control Devices* is our guidebook, but engineering judgment and common sense are to be used with it. Perhaps common sense includes understanding our clients needs and providing adequate training and/or testing. ■

(Source: Adapted from an article in the Texas T[2] Center's March 1993 "Technical Quarterly" by David Dennis of Texas A&M University)

Five Devices With Poor Driver Response

PROTECTED LEFT ON GREEN

Sign (R10-9a), TMUTCD Section 2B-37

If you want to turn left at this intersection and the green light is on, what should you do?

1. 34.7% Yield to oncoming traffic. They will have a green light also.
2. 47.5% Wait for a green arrow. Then turn left.
3. *15.5% Turn left. Oncoming traffic will have a red light.
4. 2.3% Not sure.

GROOVED PAVEMENT AHEAD

Sign (W-812), TMUTCD Section 2C-30.5

What is the purpose of this sign?

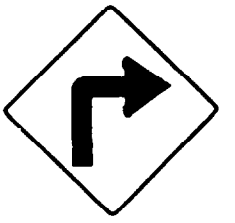
1. 16.5% To let motorists know the road will be slippery when wet.
2. 39.5% To let motorists know the road will be noisier ahead.
3. *29.2% To let motorcyclists know they should use caution.
4. 14.7% Not sure.

Turn sign (W1-1R)

TMUTCD Section 2C-4

What does this sign mean?

1. 10.7% There is an intersecting road to the right ahead.
2. *31.9% You should drive 30 miles per hour or less to make the next turn.
3. 45.2% You should turn right at the next intersection.
4. 12.2% Not sure.

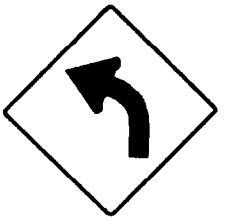


Curve sign (W1-2L)

TMUTCD Section 2C-5

How should you respond to this sign?

1. 65.0% The road will curve to the left a short distance ahead and you should slow down before reaching the curve.
2. *32.4% The road will curve to the left a short distance ahead, but you may drive the curve at the speed limit.
3. 1.7% The next mile of highway has several curves and you should slow down.
4. 0.9% Not sure.

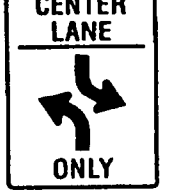


Two-Way Left Turn Lane sign (R3-9B)

TMUTCD Section 2B-19

Which one of the following statements is true when you see this sign?

1. *44.6% The center lane is to be used only for making left turns.
2. 6.7% You will be able to make only left turns at the next intersection.
3. 43.7% The center lane is to be used only for making left and right turns.
4. 5.0% Not sure.



Summer 1993 Operating Tip

Hazardous Substance Awareness

Whether you work in an office or outside, a hazardous substance will treat you just like everyone else.

Exposure to hazardous substances crosses all lines of distinction at your local agency. It is precisely this universality that makes hazardous substance awareness at local roads agencies such an important issue — a life and death issue.

You probably have learned a lot about the hazardous chemicals that you work with the hard way — through the problems they cause you, your coworkers, and the unsuspecting public. Unfortunately, occupational health experts have learned about chemical effects the same way.

Each year, about 3,000 new chemicals are introduced into industry. Their effects on the workers who use them are never tested. Most conclusions are drawn from experience — not based on laboratory experiments. However, you can use what is known to protect yourself, your coworkers, and the public from unnecessary exposure.

Material Safety Data Sheets (MSDS)

By law, every workplace is required to maintain an MSDS for any chemical kept in its inventory. Personnel who deal directly with hazardous chemicals should be trained by qualified instructors in the precautions to be exercised when handling these materials.

All personnel should at least have knowledge of the hazardous materials used at a worksite and the proper procedures to be taken in the event of an accidental exposure. This includes office and supervisory personnel, who, in the event of an emergency, may be the people who have to make a quick response. **Remember, hazardous exposure is everybody's business.**

Always read the label whenever you use any hazardous chemical.

(Source: Adapted from materials in Michigan's T² Center's newsletter, "The Bridge," Winter 1992)

Operating Tip

Hazardous Substances Commonly Found in Road Work

Substance	Materials and Operations Where Exposure is Possible	Identifying Characteristics	Identifying Symptoms	Health Effects
Ammonia	Coal tar, pitch work, and painting.	Colorless gas.	Irritates eyes. Cough and chest pains. Burning of skin. Pink frothy spit.	Severe irritation of eyes, respiratory tract and skin. Bronchitis or pneumonia.
Asbestos	Brake linings, building insulation.	Fibers of various sizes. The most dangerous are invisible.	May have no symptoms until disease is advanced. Wheezing, dry cough.	Asbestosis, mesothelioma, lung, or digestive cancer.
Asphalt	Paving, pothole repair.		Itchy and inflamed skin. Irritated eyes.	Dermatitis, burns, increased susceptibility of skin cancer from sun.
Benzene	Coal tar, pitch work, degreasing, painting, and paint removal.	Colorless liquid with characteristic odor. Highly flammable.	Drowsiness and fainting. Irritates eyes, skin, and upper respiratory tract. Nosebleed or bleeding gums.	Benzene poisoning, anemia or other blood disorders, may be connected to leukemia or chromosome damage.
Calcium Oxide (Lime)	Cement work, painting, chipping, drilling, scraping pavement.	White or grayish lumps of powder. May have yellow or brownish tint.	May burn skin, eyes, upper respiratory tract.	Conjunctivitis, dermatitis, burns, irritation of nose, and respiratory passages.
Carbon Disulfide	Degreasers, solvents, paints, insecticides.	Colorless liquid. Volatile.	Headache, giddiness.	Acute danger of brain damage and irritation of lungs and stomach. May affect nervous system and heart.
Carbon Monoxide (Exhaust Fumes)	In garages, traffic, or any place where carbon fuels are burned.	It is impossible to detect this colorless, odorless gas.	Headache, throbbing headache, reddening of skin, weakness, dizziness, blurred vision, nausea.	Prevents blood from carrying oxygen to the body and can cause serious systemic disorder including death.
Cement (Portland Cement)	Paving, chipping, or drilling of cement.	Solid, irritating in dust form.	Eye and nose irritation. Skin disorders.	Irritates eyes and skin.
Chromate's	Brightly colored paint.		Nosebleed, headaches, itchy, and inflamed skin.	Lung cancer (20-30 years after exposure). Severe irritation of upper respiratory tract, skin, and lungs. Perforation of nasal septum.
Coal Tar (pitch, creosote, creosol, acridine, anthracene)	Whenever coal tar is heated.	Volatile from heated tar.	Irritation of eyes, sunburn.	Severe sunburn, dermatitis, eye irritation. Increased susceptibly to skin cancer from the sun.

Please Note: The table should be used for basic information and awareness only. For more detailed information on hazardous substances, along with Tolerance Level Values refer to a hazardous substances handbook.

Substance	Materials and Operations Where Exposure is Possible	Identifying Characteristics	Identifying Symptoms	Health Effects
Dioxane	Solvents used in asphalt degreasers, paints, and paint removers.	Flammable liquid.	Irritation of eyes, nose, and throat. Drowsiness, headache, nausea, and vomiting.	Severe kidney, liver, or brain damage. May be fatal.
Epoxy Resins	Pothole repair.	May be solids or viscous liquids.	Dermatitis, eye irritation.	Skin problems and lung irritation.
Fiberglass	Night liner.	Needle-like fibers of various sizes, colors, or textures.	Dermatitis, itching.	Skin and lung irritation.
Gasoline (may contain benzene)	Engine fuel, solvent dilutant.	Liquid with characteristic odor, flammable.	Dermatitis, eye irritation.	Skin irritation and may affect the central nervous system.
Lead	Paint, gasoline additive, engine exhaust.		Inability to sleep, fatigue, constipation, blue or "leadline" on gums.	Effects are slow and cumulative. Anemia, colic, and neuritis, headache, blurred vision, and a variety of other effects.
Methyl Alcohol (carbinol, wood spirits, methanol, wood alcohol)	Solvents, paints, cements, antifreeze.	Colorless, volatile liquid with very mild odor.	Dry, cracked skin.	Defats skin and produces a mild dermatitis.
Methyl Ethyl Ketone (MEK)	Solvent, paint thinner.	Colorless liquid.	Irritation of eyes, nose, and throat; dermatitis, numbness, dizziness, and drowsiness.	Irritation of eyes, mucus membranes and skin. Severe exposure can affect the nervous system.
Methylene Chloride	Solvent, paint stripper, degreasers, insecticides.	Colorless liquid.	Fatigue, weakness, numbness, and tingling of limbs, nausea, skin, and eye irritation.	Mild nervous system depressant, irritation to eyes, severe exposure may cause liver and kidney damage.
Toluene (may be contaminated with benzene)	Paint thinner and solvent, cleaning agents, gasoline.	Colorless liquid.	Fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils.	Nervous system depression, dermatitis, eye irritation, severe exposure may cause liver and kidney damage.
Turpentine	Solvent, paint thinner.	Colorless or yellow volatile liquid.	Irritation of eyes, skin, nose throat; dizziness and nausea.	Bladder and kidney damage, dermatitis, conjunctivas, and nervous system depression.

(Source: From The Bridge Fact Sheet, Winter 1992, Michigan Technological University, Transportation Technology Transfer Center)

Continued from page 8

How Chemicals Enter Your Body

The most prominent hazardous substances in the workplace today are chemicals. Understanding how chemicals can enter your body, how your body reacts to them, and what you can do to eliminate exposure is the first step in making your agency a safe to work.

Your body has well-developed defense system that protects you against invasion from many foreign substances. The defense system includes the lining of your respiratory system (nose, air tubes, lungs), your skin, and the lining of your digestive tract (mouth, food tubes, stomach, and intestines). However, the system is not foolproof and hazardous substances can pass its barriers and enter your body.

The way a substance enters the body affects the damage it can do and what measures must be used to control it.

Inhalation — You can breath in gases, liquids in their vapor state, and tiny solids such as dusts and fumes. Once in haled, they irritate your nose and respiratory track, and can pass from your lungs into your bloodstream and then to other parts of your body.

Skin Contact — Some substances can enter through the skin in hazardous amounts. Entry is faster through skin that is cracked or inflamed (sunburned). Sweat-soaked or hot skin is a less effective barrier. Solvents break down the fat in your skin and destroy its protective mechanism, increasing its susceptibility.

Some chemicals may actually penetrate the skin, enter the bloodstream and travel throughout your body. Others that do not penetrate may still cause serious skin problems.

Ingestion — Eating or smoking with contaminated hands or in an contaminated place can introduce hazardous substances into your digestive system. Those that are not destroyed by the digestive tract can travel throughout your body. This is a major problem with highly toxic substances such as lead.

Injection — Chemicals can enter your body through cuts, skin abrasions, or any type of puncture wound from a possibly contaminated object.

When Will Effects Appear?

Effects of chemicals may be considered acute and/or chronic.

Acute — Developing quickly but usually of short duration. Acute effects are readily seen and connected to the cause.

Chronic — Chronic reaction take a long time to develop and may require prolonged exposure. Sometimes, the disease appears long after the last exposure and may be difficult to identify the cause; or it may be too late.

Body's Reactions to Exposure

Local — Symptoms develop where the substance enters or contacts the body. This is the most common appearance.

Systemic — Some effects are not limited to the point of entry or contact and may involve more than one part of the body. You may not realize that the effect is related to an exposure on your job.

Sensitization — Some people react or have allergies to a substance while others do not. An initial exposure may not cause a reaction, but later contact with the same or similar substances might make you ill.

Eliminating Hazardous Materials

Once hazardous substances have been identified the best way of dealing with them and their negative effect is to eliminate their use in your workplace.

1. Substitute safe or less hazard products for those presently in use. For example, use turpentine instead of benzene, zinc pigments instead of lead.
   When products cannot be substituted, other approaches need to be taken.
2. Change the process used in performing a particular task. For example, transfer substances through closed mechanical systems; minimize dust by using pellets; arrange the work area to prevent accidental exposure.
3. Store materials in proper containers (steel, plastic, or glass) and secure in a cool dry area away from the direct rays of the sun or other heat source.
4. Avoid the storage of incompatible items in close proximity. Even small leaks might allow mixing that could produce deadly gas or vapors.
5. Make sure all containers have labels that clearly disclose the contents and any special warning.
6. Clean spills immediately to prevent accidental mixing with incompatible substances and to prevent exposure by unsuspecting coworkers. Have proper containment or cleanup materials on site.
7. Keep soaked rags and other wastes in closed container; remove from the work site frequently.
8. Ensure that eye wash stations and deluge showers are available and in proper working order. The first 15 seconds after an injury is often the most vital.
9. Make sure that eating and smoking facilities are separate from areas where hazardous substances are used or stored.
10. Store and wash work clothes at the work site. Work clothes absorb hazardous materials and prolong exposure. If you bring these clothes home, you can expose your family to serious illnesses.

For additional information on hazardous materials, contact your agency's safety officer. Additional information is also available in the following publications.

NIOSH Pocket Guide to Chemical Hazards, NIOSH Registry of Toxic Effects of Chemical Substances. U.S. Gov. Printing Office, (313) 226-7817.

Chemical Hazards of the Workplace, Van Norstrand Reinhold, (212) 254-3232.

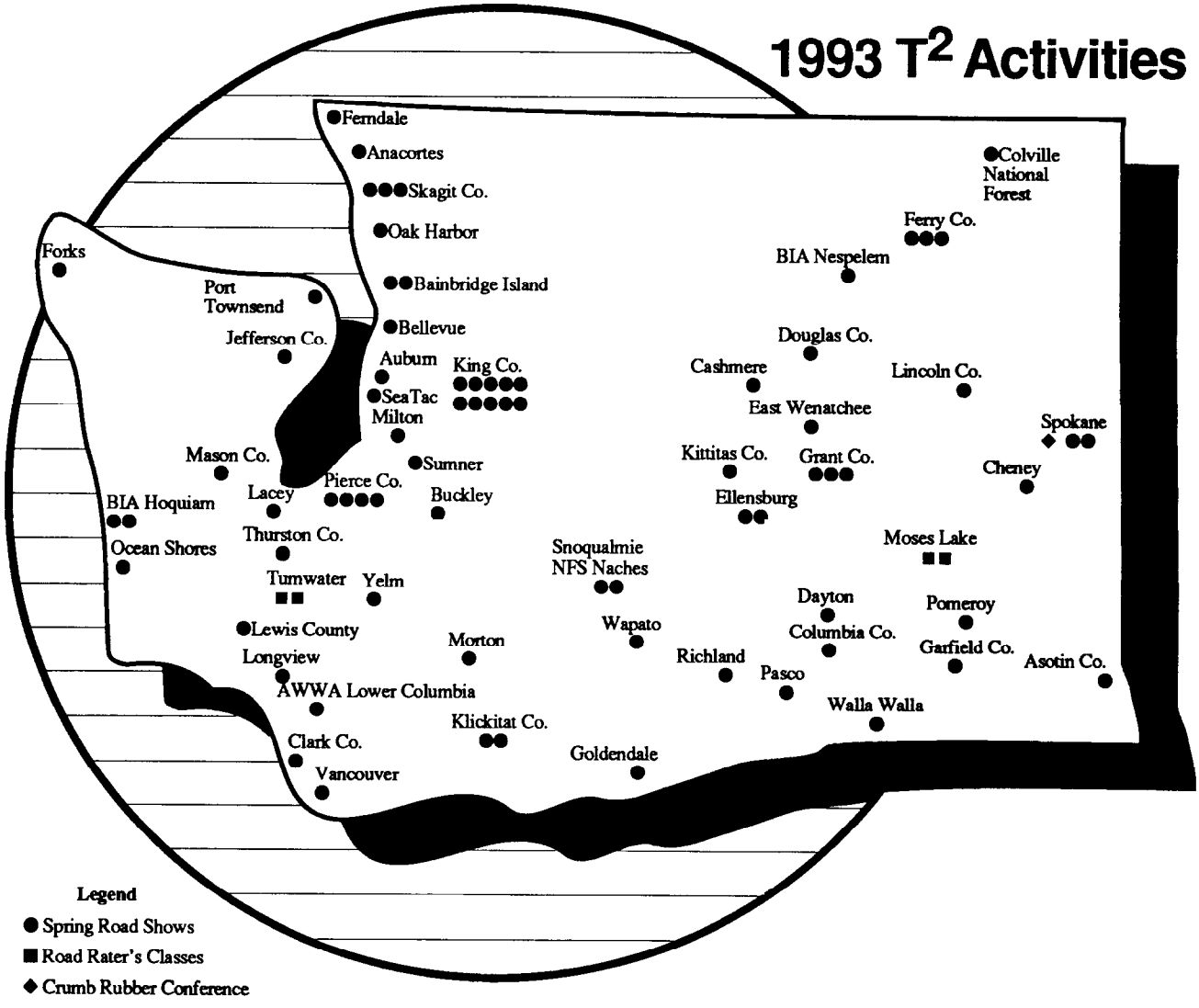
Threshold Limit Values for Chemical Substances, ACGIH, (513) 661-7881.

On the Site Training — The Spring T^2 Road Shows

As in previous years the spring road shows by the T^2 Center were a popular way for local agencies to get some training for their employees. George McHanley, our T^2 trainer, thanks all that hosted a session. By extending the spring road shows for an additional month beyond our normal three-month efforts, more sessions were held for more people.

This spring, 76 sessions were held whereby 1,162 people from 55 agencies received training. In total over 3,500 person hours of training was provided by the spring road shows.

Remember that any of our noncopyrighted tapes are available for loan in Washington. Contact Donna Stallings at (206) 705-7372, if you wish to borrow our noncopyrighted tapes.



The Ten Commandments of Political Engineering

By George C. Protopapas

My bachelor of science degree in Civil Engineering from the University of Michigan launched me on my career in 1951, well equipped to perform all the basic civil engineering functions that could come my way. During my first 15 years of work, I designed highways, bridges. storm drains, sewers, and managed design divisions.

It was when I became an assistant county engineer that I recognized that there had been a deficiency in my college curriculum. There had been no courses in "political engineering." This void really became evident when I was appointed county engineer and began reporting directly to a five-person county board of supervisors.

"Political engineering" is the "technology" of getting along with an elective body which is your boss. It is getting along with five different personalities coming from five different walks of life. Some of them are bound to be experts in all phases of engineering and operating your department.

Maybe some of you are not involved with this subject at the moment. However, as you are promoted in a county or city public works department or a special district, you will get more and more involved in "political engineering." Even those working in large agencies such as Caltrans may find "political engineering" useful, especially where projects require cooperation from local governments.

Current college curricula still lack training on how to deal with a political body as your boss, so I would like to give you the list of "10 Political Engineering Commandments" which I have formulated during my 24 years as a county engineer. Even though these "commandments" relate to a county board of supervisors, they also apply to a city council or a special district's board of directors.

The Ten Commandments Are

❶ Establish a good relationship with your board. This is extremely important, because it helps to determine how successful you will be in many other aspects of your job.

❷ Keep the board informed about the operations of your department and any other matter that may be of interest to them. If there is an item of interest to an individual board member, make sure that you brief him or her on it. The better you make a board member look to his constituents by making him appear knowledgeable. the more he will appreciate and respect you.

❸ Always make yourself available to each board member, even if it means leaving a meeting to answer a phone call from one of them.

❹ Fight as hard as you can to have the board adopt your professional recommendation. If the action taken by the board is contrary to your recommendation, implement it as energetically as if it were yours.

❺ Never ask board members what they want to do regarding an administrative or engineering matter. Go to them with your recommendation. Consider their comments, but let the final action be your decision. You never want board members to get the impression that they are running your department. Their responsibility is making policy, not managing your department.

❻ To the extent possible, have your board adopt policies defining your responsibilities. This will discourage individual board members from trying to have you do something that may be unethical or unprofessional.

❼ When a board member refers a complaint from a constituent to you, treat it with the utmost importance. If your department can solve the constituent's problem, consider letting the board member pass on the good news to the constituent who complained. If you are unable to do anything regarding the complaint, let your department wear the "black hat" and respond for the board member.

Political engineering is the "technology" of getting along with an elective body as your boss.

❽ Do not show favoritism to individual board members. Treat them all in the same manner.

❾ When you receive compliments from the public, suggest that people pass on the compliments to the board in the form of correspondence.

❿ Never embarrass the board or any of its members in public. If a board member makes a mistake at a public meeting, do not correct him or her in public. Discuss the subject later, when you are alone. Always try to make your board members look good in public.

I hope that you find these "commandments" useful in your current work. If not, file them for future use as you climb the career ladder. ■

(Source: Tech Transfer, Technology Transfer Program, University of California, October 1992)

Committee Defines Road Schools Program

Meeting in Wenatchee on April 29, the planning committee for the Road and Street Maintenance Supervisors Schools defined the 1993 programs. Using comments of last year's program as a guide to what the attendees desired for the 1993 schools, the committee members settled on the following sessions.

1. Equipment Maintenance — A mix of presentations by speakers and numerous shorter presentations by vendors.
2. Environmental Issues — Emphasis on success stories.
3. Bridge Maintenance
4. Legal Issues — Possible subjects may be ADA, roadway obstacles, work zone safety, training and certification, light-duty workers, et al.
5. Human Resources — Suggestions included stress management, harassment, doing more with less people. innovative resources, OJT, motivational tools.
6. Asphalt/Concrete Maintenance — Ideas were what is new in this area, use of fabrics, crumb rubber, glass use, polymers, et al.

Session moderators will be confirming their speeches and their programs soon for the two conferences which are schedule:

East Side — October 5-7, Red Lion Inn, Spokane

West Side — November 3-5, Everett Pacific Hotel ■

Potential New Use for Sugar Beet Extract

Indiana and Michigan are reporting the results of first experiments with a liquid extract from sugar beet called Molex. Marshall County, Indiana tried it on dust and reported "a slight haze but no dust cloud." They tried it to stabilize a 3.4-mile section of an old chip-seal road, and it worked.

Molex is described as "a little thicker than water, but not as thick or sweet as syrup." It is the residue from sugar beets after the sugar, molasses, and beet pulp have been removed. It is "manufactured" by Savannah Foods in Fremont, Ohio. It has been used in cattle-feed and as a binder for such powders as iron oxide, carbon, and limestone.

Molex is now undergoing analysis at the Civil Engineering Department of Michigan Technology University. Molex is:

1. Very hygroscopic (attaches to and holds water)
2. Does not freeze even at -27°C (-16°F)
3. Has a near-neutral Ph (should be noncorrosive)
4. Has a high level of potassium chloride (which can replace calcium chloride)
5. Costs less than oil/salt mixtures

The man most interested in operational tests is the current President of the Indiana Association of County Highway Supervisors. He is Milan Levett, Superintendent, Marshall County, Indiana.

Mr. Levett shows the same cautious interest as we do. New miracle products usually prove out to have properties and limitations that spoil our hopes. Nothing is yet known about Molex's behavior on icy roads, and we do not know how long it lasts on dusty roads. If you're interested in running tests yourself, we recommend you call Mr. Levett at (219) 936-2181. ■

(Source: Adapted from an article in the Nevada Milepost, Winter 1992 by the Idaho T² Center)

NHTSA Warns of Aerosol Tire Inflators

The National Highway Traffic Safety Administration (NHTSA) recently cautioned motorists and urged workers at service stations and auto and tire repair shops to be careful while fixing tires that have been filled with aerosol inflators.

Many of the aerosol inflators contain a flammable propellant that can cause an explosion under certain circumstances.

Despite flammability warnings on the cans and instructions for safe use, many consumers may be unaware of the potential danger. NHTSA's Administrator, Jerry Curry, noted: "Aerosol flat tire fixes should be considered as emergency, temporary repairs and used with caution. It is always preferable to have the tire repaired professionally or replaced.

"After filling a tire with an aerosol inflator, do not expose the tire to extreme heat, flames, sparks, or other ignition sources. Be careful using metal tools like tire irons, metal reamers, and hammers because they could cause sparks while being used to repair a tire," Curry said.

Consumers and service personnel should assume a tire may have been repaired previously with an aerosol product. "Before starting to fix a tire, remove the valve core and completely deflate the tire to eliminate as much of the aerosol propellant as possible. Then, inflate and deflate the tire a few times to completely remove all traces of the potentially explosive propellant. Once this is done, you may repair the tire without the risk of explosion," Curry said. ■

(Source: Adapted from Idaho T² Center's "Wagonwheel Express," Spring 1993)

Back Supports

Thousands of construction workers, garbage collectors, ditch diggers, truck drivers, welders, carpenters, and at-home residents doing heavy lifting, are practicing preventative back maintenance 1990s style.

Back supports have joined the hard hat, ear plugs, and goggles as standard safety gear. A number of versions are on the market, most in the $35 to $65 range. The device consists of a wide belt made out of lightweight fabric with five vertical supporters in the back area and are connected in front by Velcro. Some have shoulder-straps or harnesses.

Back supporters keep wearers from bending and lifting improperly by compelling them to bend with their knees, not their back. For best results, wearers should do a series of muscle-stretching and loosening exercises before donning the device.

Companies providing back supports for high-risk employees say the supports have resulted in a decrease in back injuries, which means considerable savings in workman's compensation and time lost from work.

(Source: Adapted by Florida T² Center, Florida Times Union, May 19, 1992)

SHRP/FHWA Evaluate Surface Rehabilitation Techniques

As an increasing number of high volume roads reach the end of their usable service lives, methods for extending their lives in the most cost-effective manner are more urgently needed. One way to accomplish this is through the increased use of relatively low-cost surface rehabilitation techniques that help improve the functional condition, and thus the overall performance, of the pavement.

During 1990, several preventive maintenance treatments, including surry seals, chip seals, and thin hot mix overlays, were applied to existing pavements under SHRP's Specific Pavement Studies (SPS-3) experiment, "Flexible Pavement Treatments." The treatments were applied throughout the United States and Canada to evaluate the effectiveness of maintenance strategies on pavement service life. Eighty-one test sites were selected to cover various climates and pavement conditions as well as moderate to heavy traffic volume roads. The performance of these test sections is now being evaluated under SHRP LTPP efforts.

Besides traditional surface rehabilitation techniques, many other approaches are now being pursued, particularly in Europe. These new techniques employ different additives/modifiers and aggregate compositions as well as ways to attain increased pavement service life. To evaluate many of the emerging techniques and to complement SHRP's SPS-3

objectives, FHWA initiated a parallel project, TE-9 on "Surface Renewal." The project was intended to gather information on usage, composition, construction, performance, and cost of traditional and emerging surface rehabilitation techniques. In 1991 and 1992, FHWA staff conducted nationwide reviews of surface rehabilitation techniques during 1991 and 1992, with particular emphasis on such promising techniques as microsurfacing, polymer modified chip seals, and modified thin hot mix overlays. The projects were selected to cover various environmental and traffic conditions.

A summary report was distributed nationwide to user agencies, industry, and academia.

The compilation and transfer of such information should assist the designer (or manager) when selecting the type of surface rehabilitation or preventive maintenance technique to use for roads that will meet both the system need (budget) and the performance criteria.

(Source: North Carolina T^2 Center's newsletter "Transportation Tracks," Spring 1993)

Free Publications

For Washington recipients only:
Contact Donna Stallings at (206) 705-7372 or SCAN 705-7372 if you want publications.

Railroad-Highway Grade Crossing Handbook

This handbook provides general information on railroad-highway crossings, including characteristics of the crossing environment and users, and the physical and operational improvements for safe and efficient use by both highway and rail traffic. The handbook will be of interest to federal, state, and local highway agency personnel, railroad officials, consulting engineers, and educators concerned with railroad-highway grade crossing safety and operation. (10 copies available) FHWA-TS-86-215

Local Low Volume Roads and Streets

November 1992

This well organized manual provides local agencies with basic information on planning, design, construction, and maintenance of local low volume roads and streets. It is easy to use and specific topics may be quickly located. The publication was made possible by the joint efforts of ASCE, FHWA, and the USDA Forest Service. (100 copies available)

Scrap Tire Utilization Technologies

February 1993

Currently an estimated 2 to 3 billion tires are stored in stockpiles throughout the United States. To assist you in assessing the available options and finding solutions, this brief report by the National Asphalt Pavement Association provides a comparison of the current uses of scrap tires. This report uses engineering feasibility and economic analysis to evaluate each technology and considers the potential environmental implications also. (100 copies available)

Roadside Improvements for Local Roads and Streets

October 1986

This FHWA booklet is a simple general guide to effective, low cost methods of improving and enhancing roadside safety. By using any or all the improvements discussed, one can provide the driver with a better chance of recovering from an accident and/or reduce the potential severity of accidents along the edge of the highway. (50 copies available)

Improving Operational Safety on Local Roads and Streets

This FHWA booklet is a simple general guide to effective, low cost methods of improving and enhancing operational highway safety. Operational improvements provide the driver with the necessary and important information to control and maintain the vehicle on the roadway system. Operational improvements are often used to supplement or mitigate the effects of substandard roadway features by providing the driver with information on potential hazards ahead. (50 copies available) FHWA-RT-88-039

Guide to Safety Features for Local Roads and Streets

This simple FHWA guide deals with the construction and maintenance practices that will lead to increased safety on local roads and streets. It provides local transportation agency personnel with important information related to highway safety features. The intended uses and functions for each of several features are discussed. Examples of both good and poor practices are given. This guide will be especially helpful to field personnel involved in construction, installation, and maintenance of safety related features on the highway system. (50 copies available) FHWA-RT-88-027

Crumb Rubber Modifier Workshop Manual

Currently, we have extra copies of the manual used at the March seminar. If you would like a copy of this material, contact Donna Stallings (206) 705-7372.

The BULLETIN

Summer 1993

The Technology Transfer (T^2) Program is a nationwide effort financed jointly by the Federal Highway Administration (FHWA) and individual state departments of transportation. Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation to local highway and transportation personnel.

Any opinions, findings, conclusions, or recommendations presented in this newsletter are those of the authors and do not necessarily reflect the views of WSDOT or FHWA. All references to proprietary items in this publication are not endorsements of any company or product.

Published by

Washington State Department of Transportation
Local Programs Division
Northwest Technology Transfer Center
Transportation Building
P.O. Box 47390
Olympia, WA 98504-7390

In cooperation with

U. S. Department of Transportation
Federal Highway Administration

BULLETIN
Northwest Technology Transfer Center
Washington State Department of Transportation
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